Acquisition and the CMMI^{SM}

A Presentation to the
1st Annual CMMI Technology Conference
and User Group
November 14, 2001
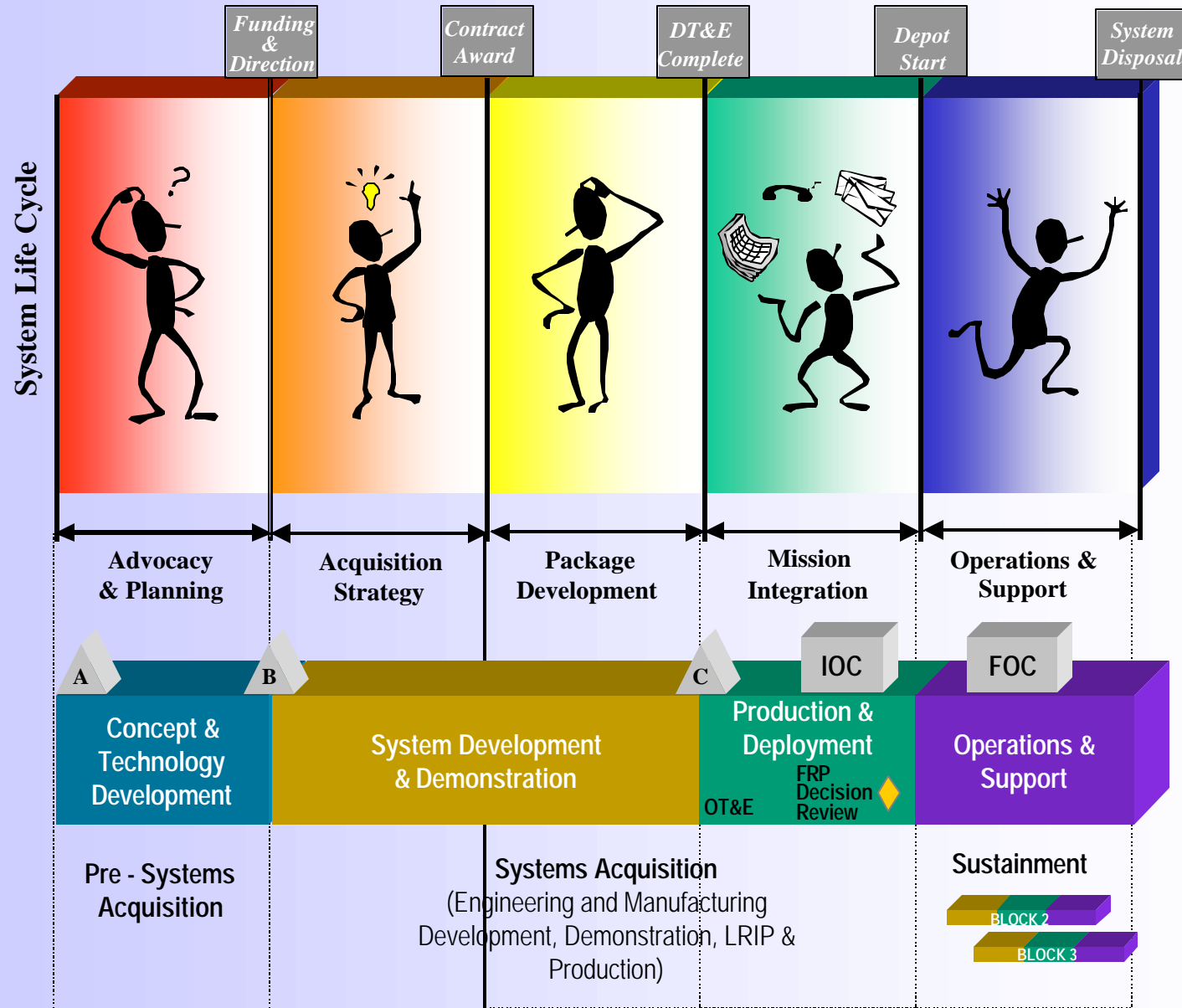
Panel 2 - Acquisition and the CMMI Model

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^{SM} CMMI is a service mark of Carnegie Mellon University

Acquisition and the CMMI^{SM}

- **The Life Cycle Stakeholders**

- **Spiral Development and the Life Cycle**

- **Spiral Development, Enterprise Focus & CMMI**

- **A Case for Process Sharing**

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DoD Program Life Cycle

System Life Cycle

| Funding & Direction | Contract Award | DT&E Complete | Depot Start | System Disposal |

| Advocacy & Planning | Acquisition Strategy | Package Development | Mission Integration | Operations & Support |

A — B

C

IOC

FOC

Concept & Technology Development

System Development & Demonstration

Production & Deployment

OT&E

FRP Decision Review

Operations & Support

Pre - Systems Acquisition

Systems Acquisition
(Engineering and Manufacturing Development, Demonstration, LRIP & Production)

Sustainment

BLOCK 2

BLOCK 3

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DoD Program Life Cycle Stakeholders

Stakeholders

	Concept & Technology Development (A)	System Development & Demonstration (B)		Production & Deployment (C / IOC)	Operations & Support (FOC)
		Pre-Award	Post-Award		
Certification				✓	
Congress	✓				
Contractor			✓		
Customer	✓	✓	✓		✓
Deployment				✓	
DOD Policy		✓			
Acquisition Agency	✓	✓	✓	✓	✓
Experimentation	✓				
Industry		✓			
Legal / Contracting		✓			
Service HQ & JCS	✓	✓			
Safety					✓
Sustainment			✓	✓	✓
Test			✓	✓	
Training				✓	
User	✓		✓	✓	✓

✓ **Must be involved**   **May be involved**

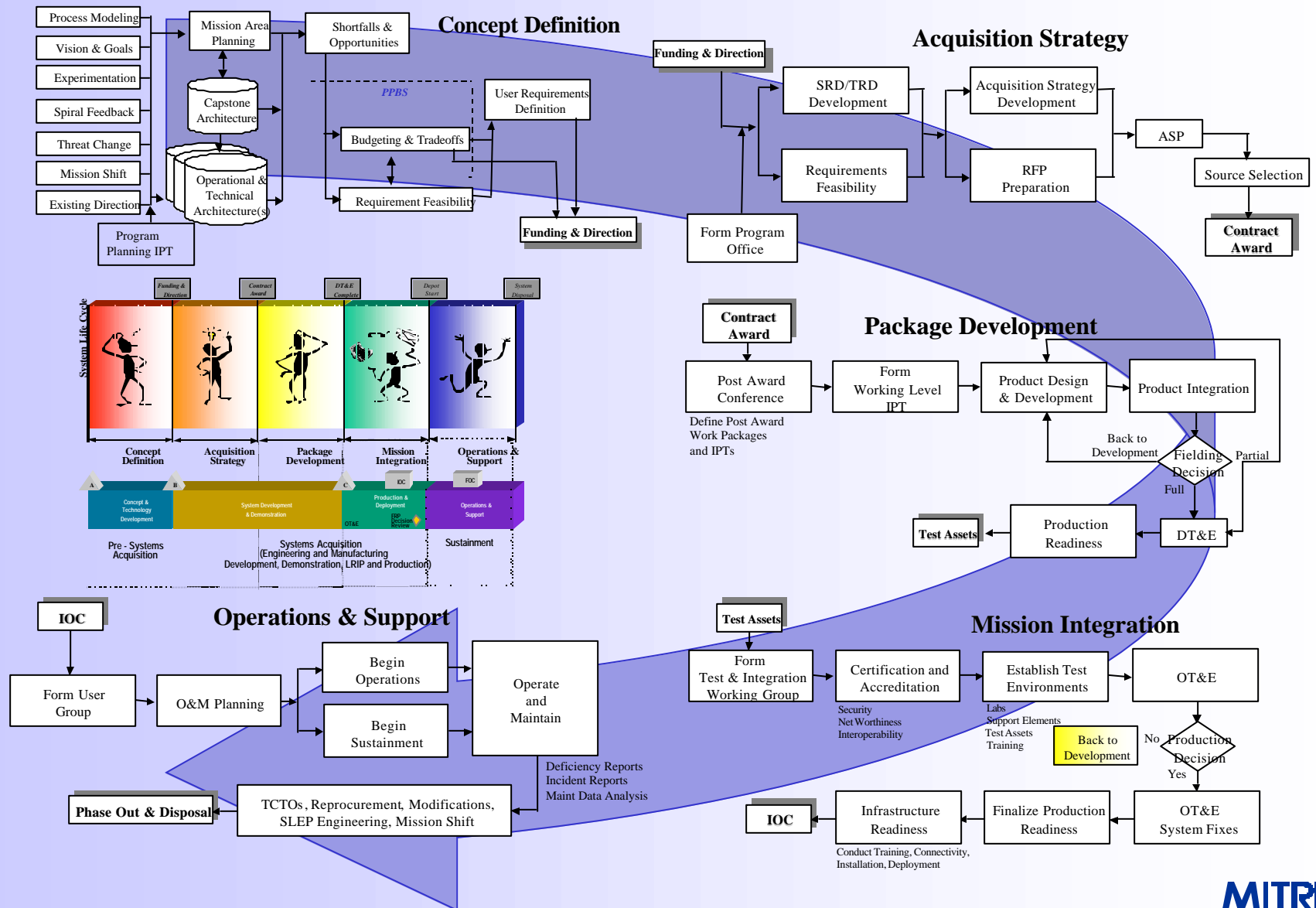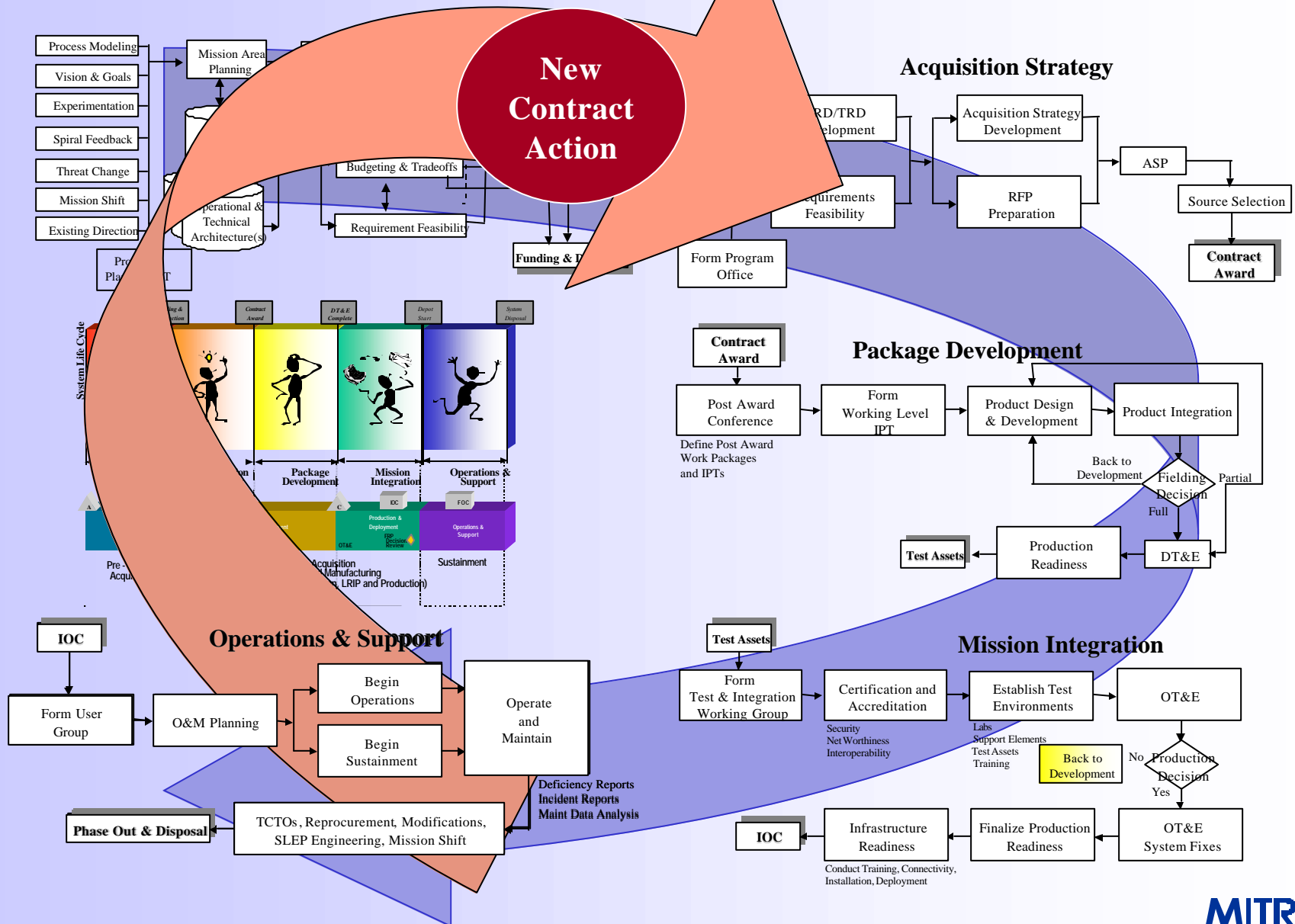**MITRE**

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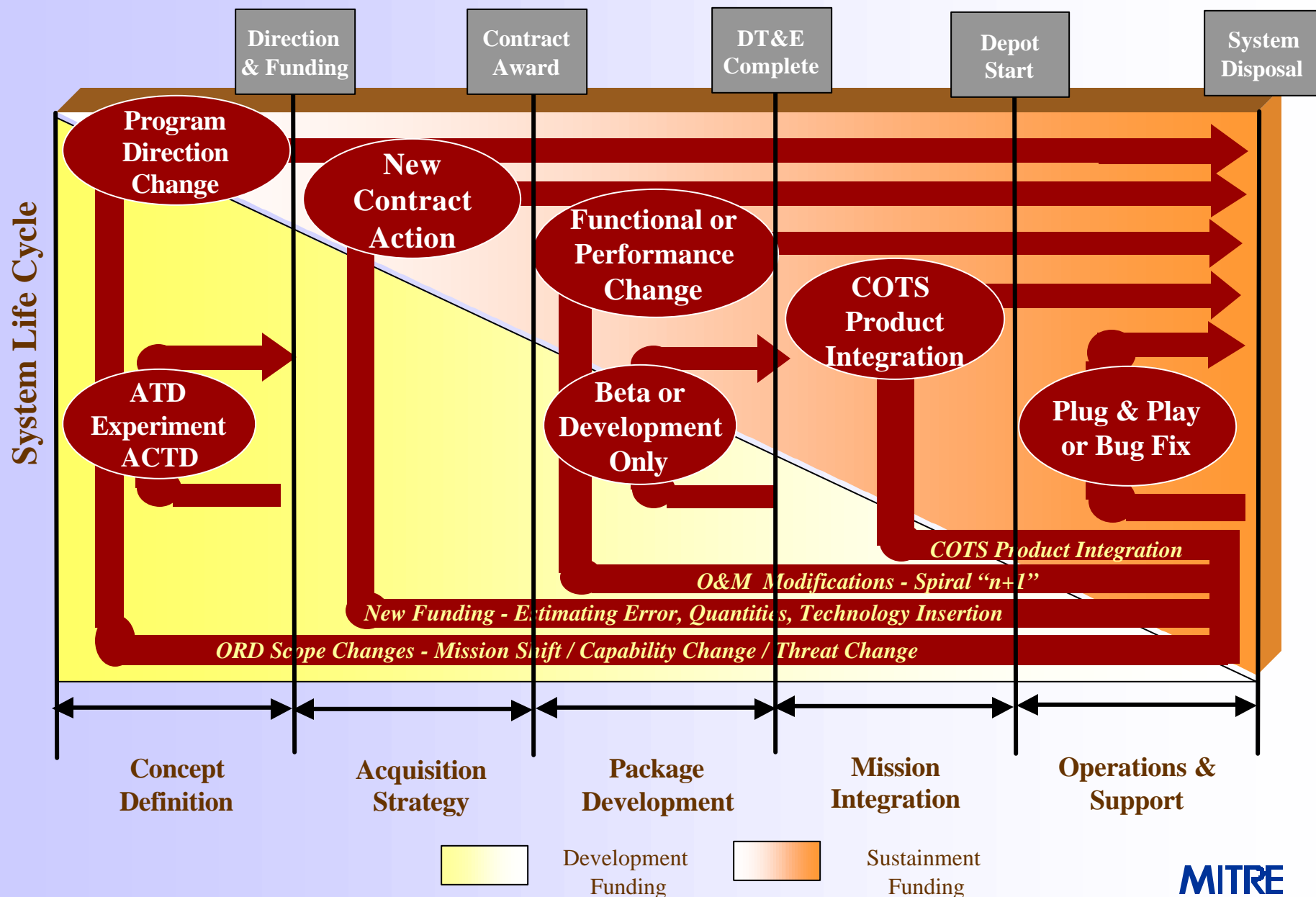
- **A Case for Process Sharing**

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A Serial Program Life Cycle

Concept Definition

- Process Modeling
- Vision & Goals
- Experimentation
- Spiral Feedback
- Threat Change
- Mission Shift
- Existing Direction

Mission Area Planning

Shortfalls & Opportunities

Capstone Architecture

Operational & Technical Architecture(s)

Program Planning IPT

PPBS

Budgeting & Tradeoffs

Requirement Feasibility

User Requirements Definition

Funding & Direction

Acquisition Strategy

Funding & Direction

SRD/TRD Development

Requirements Feasibility

Form Program Office

Acquisition Strategy Development

RFP Preparation

ASP

Source Selection

Contract Award

System Life Cycle

Funding & Direction	Contract Award	DT&E Complete	Depot Start	System Disposal

| Concept Definition | Acquisition Strategy | Package Development | Mission Integration | Operations & Support |

| A | B | C | IOC | FOC |

| Concept & Technology Development | System Development & Demonstration | Production & Deployment | Operations & Support |

OT&E
FRP Decision Review

Pre - Systems Acquisition

Systems Acquisition (Engineering and Manufacturing Development, Demonstration, LRIP and Production)

Sustainment

Package Development

Contract Award

Post Award Conference

Define Post Award Work Packages and IPTs

Form Working Level IPT

Product Design & Development

Product Integration

Back to Development

Fielding Decision — Partial — Full

DT&E

Production Readiness

Test Assets

Operations & Support

IOC

Form User Group

O&M Planning

Begin Operations

Begin Sustainment

Operate and Maintain

Deficiency Reports
Incident Reports
Maint Data Analysis

TCTOs, Reprocurement, Modifications, SLEP Engineering, Mission Shift

Phase Out & Disposal

Mission Integration

Test Assets

Form Test & Integration Working Group

Certification and Accreditation

Security
Net Worthiness
Interoperability

Establish Test Environments

Labs
Support Elements
Test Assets
Training

OT&E

Back to Development

No — Production Decision — Yes

OT&E System Fixes

Finalize Production Readiness

Infrastructure Readiness

Conduct Training, Connectivity, Installation, Deployment

IOC

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One Type of Life Cycle Spiral

New Contract Action

Process Modeling
Vision & Goals
Experimentation
Spiral Feedback
Threat Change
Mission Shift
Existing Direction

Mission Area Planning

Budgeting & Tradeoffs

Requirement Feasibility

perational & Technical Architecture(s)

Pre Pla T

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Form Program Office

System Life Cycle

Contract Award

DT&E Complete

Depot Start

System Disposal

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Pre - Acqu

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Operations & Support

Acquisition Manufacturing LRIP and Production)

Sustainment

IOC

FOC

Production & Deployment
FRP Decision Review
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Operations & Support

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Infrastructure Readiness

Conduct Training, Connectivity, Installation, Deployment

Finalize Production Readiness

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A Potential Set of Life Cycle Spirals

System Life Cycle

Milestones (top row):
- Direction & Funding
- Contract Award
- DT&E Complete
- Depot Start
- System Disposal

Spiral elements:
- Program Direction Change
- New Contract Action
- Functional or Performance Change
- COTS Product Integration
- ATD Experiment ACTD
- Beta or Development Only
- Plug & Play or Bug Fix

COTS Product Integration
O&M Modifications - Spiral "n+1"
New Funding - Estimating Error, Quantities, Technology Insertion
ORD Scope Changes - Mission Shift / Capability Change / Threat Change

Phases (bottom row):
- Concept Definition
- Acquisition Strategy
- Package Development
- Mission Integration
- Operations & Support

Legend:
- Development Funding
- Sustainment Funding

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Acquisition and the CMMI^{SM}

- **The Life Cycle Stakeholders**

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An Enterprise Spiral Development Model

Version 1.0

Operational Baseline Planning and Control

Operational Baseline

Operations & Support

Operational

Shortfall

Enterprise and Infrastructure Baseline Planning and Control

Mission Integration Level

Enterprise

Shortfall

Integrate and Field Enterprise Increment 1

Integrate and Field Enterprise Increment 2

Component System Baseline Planning and Control

Development Increment 1

Yes

Transition ?

No

Development Increment 2

Beta Test or Defer Fielding

Acquisition & Development Level

Program Office

Development Increment 3

Concept Definition Transition Baseline Planning and Control

COTS/Technology Insertion

Subsequent Spiral

User Requirements Definition

Yes

Transition to Development ?

No

Yes

Plug & Play ?

No

Yes

Try Again ?

No

Concept Definition Level

Process Reengineering

CONOPS

Yes

Integration Only ?

No

Experimentation

Planning and Experimentation

Stop

No

All 4 Levels Exist Simultaneously

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An Enterprise and Life Cycle Focus Is Necessary
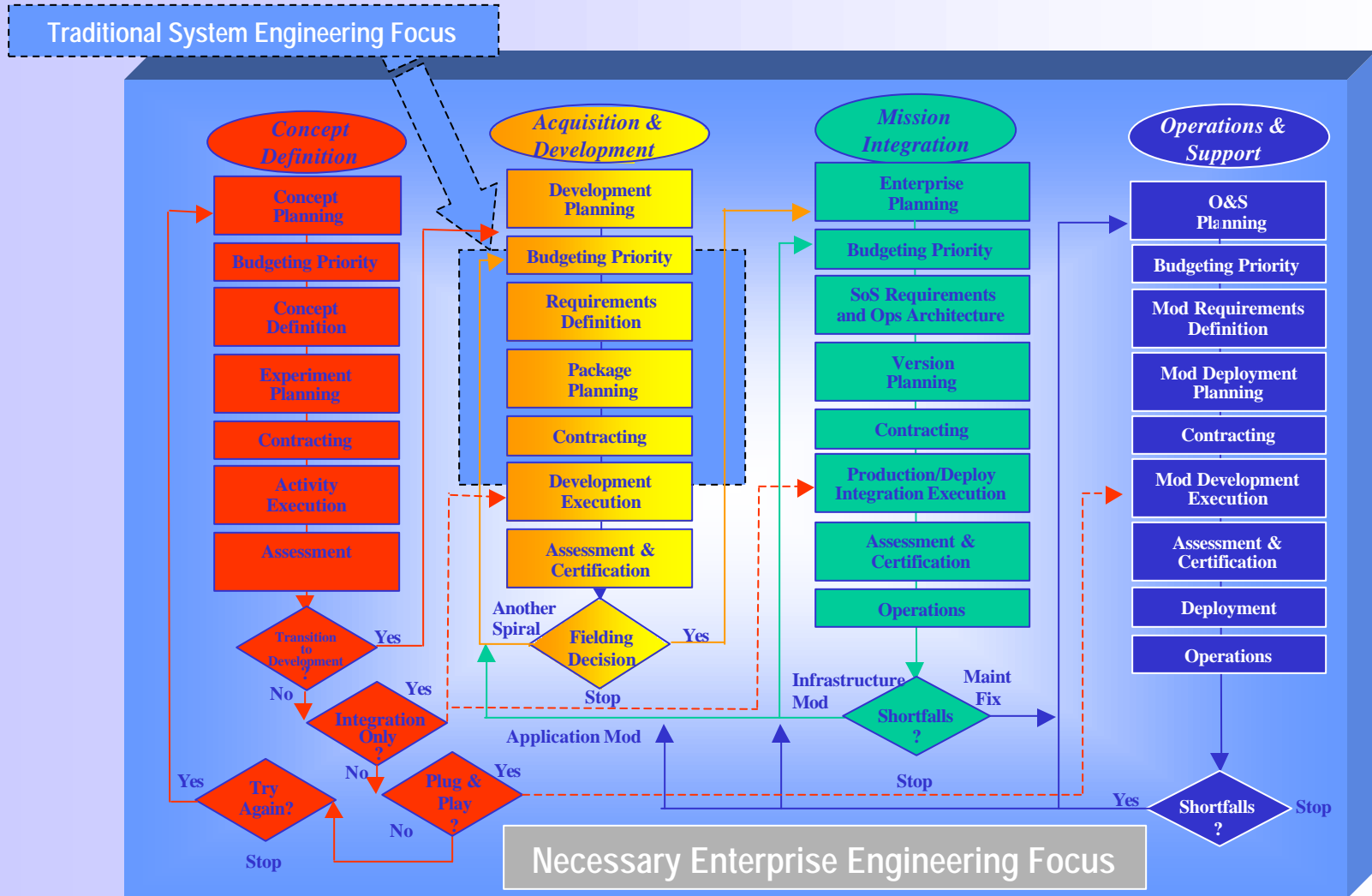
How Does CMMI Fit Our Business Flow?
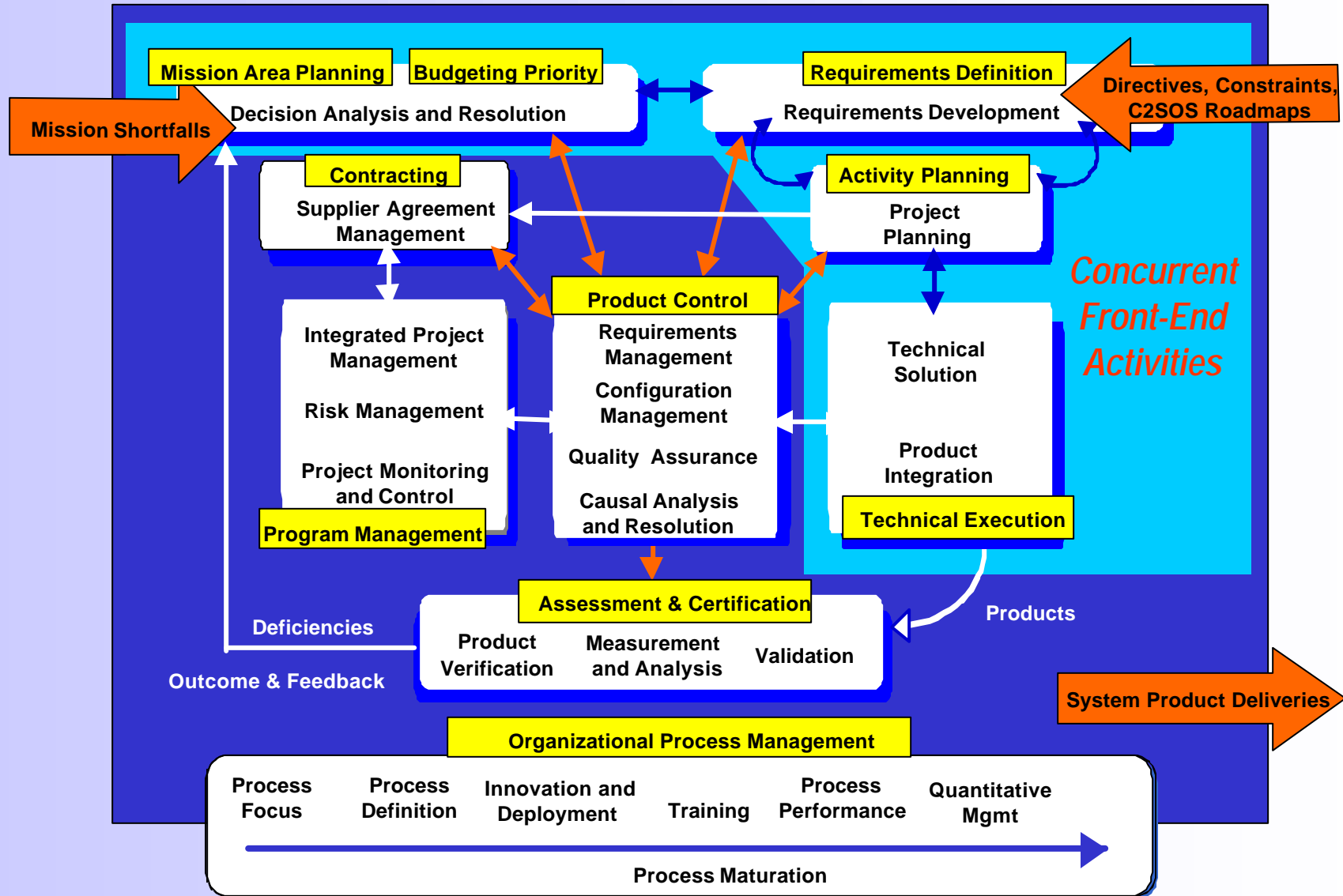
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Acquisition Environment - 1980s

1980's Independent Organizations

Acquisition

Operations

80s Technology

Formal Communications

Large Defense Budgets

Sustainment

Contractors

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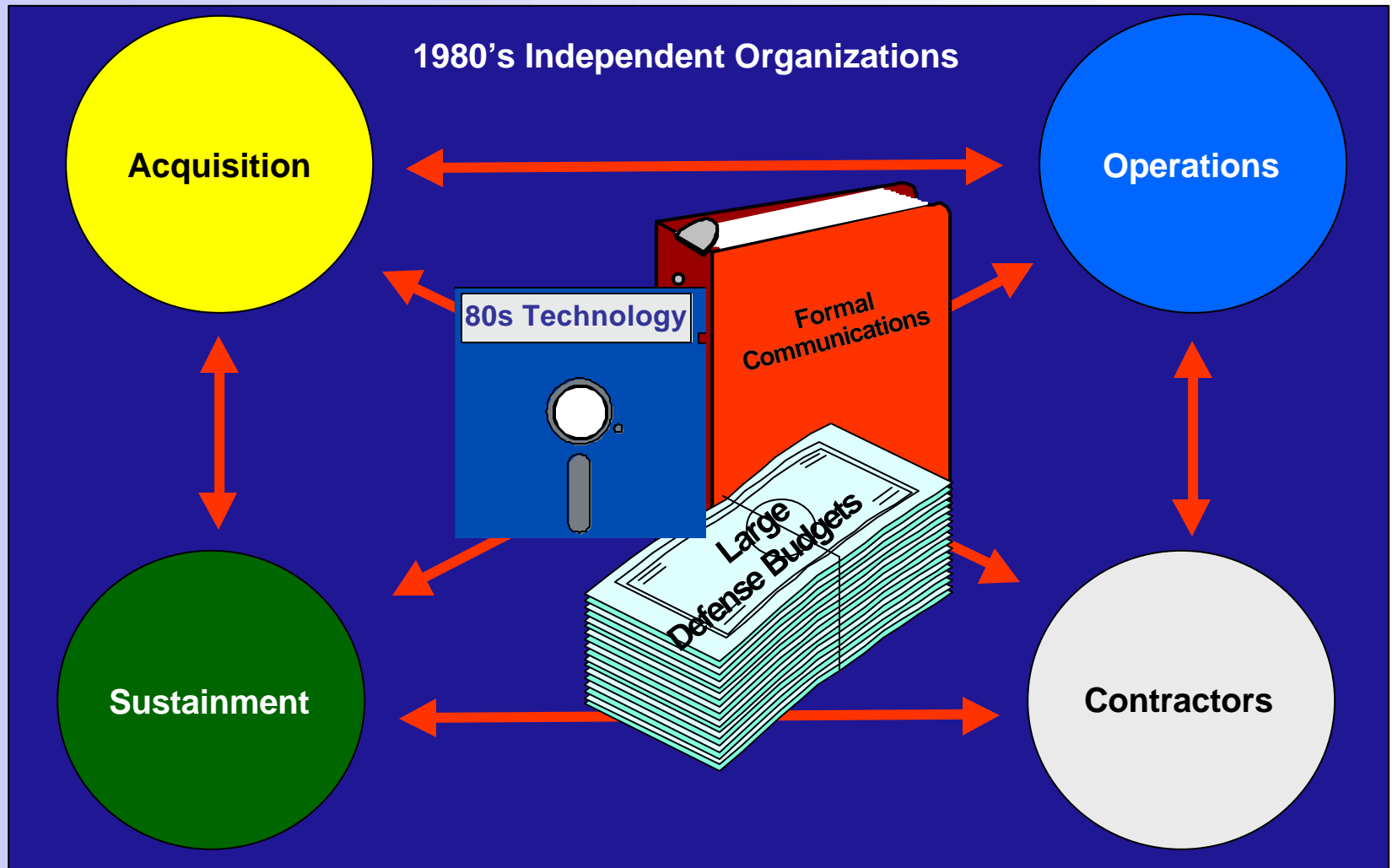
Acquisition Organizations - Today

Impacts on 2000's Acquisition Organizations

- **System of System Demands**
- **Spiral Development**
- **Constant Initiative Flow**
- **Increased ACQTEMPO**
- **Outsourced Workforce**
- **Lifecycle Management**
- **Impatient Customers**
- **Acquisition Reform**
- **"TSPR" Contracts**
- **Experience Drain**
- **Smaller SPOs**

IPTs

Smaller Defense Budgets

COTS

Rapid Technology Change

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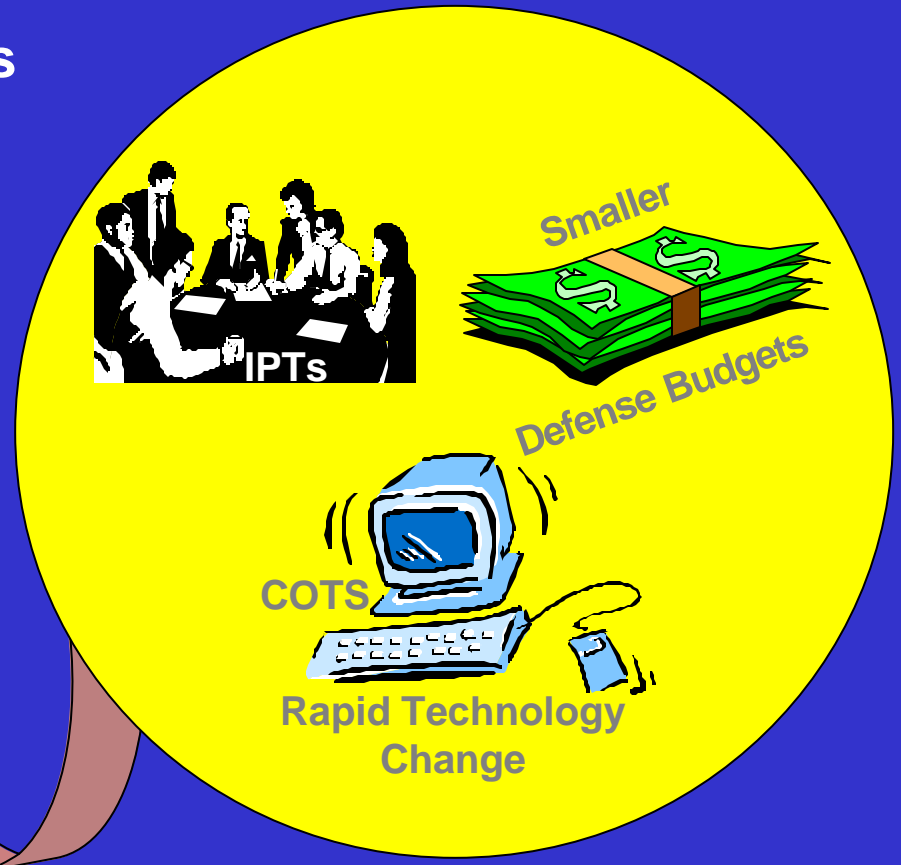
Operations Organizations - Today

**Impacts
on
2000's Operations Organizations**

- **Smaller Force**
- **Coalition Operations**
- **Interoperable Systems**
- **Increased OPSTEMPO**
- **Changing Missions**
- **Changing Threats**
- **CONUS Based**
- **Global Commitments**

Expeditionary Forces

Smaller Defense Budgets

Joint and Coalition Interoperable

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Sustainment Organizations - Today

Impacts
on
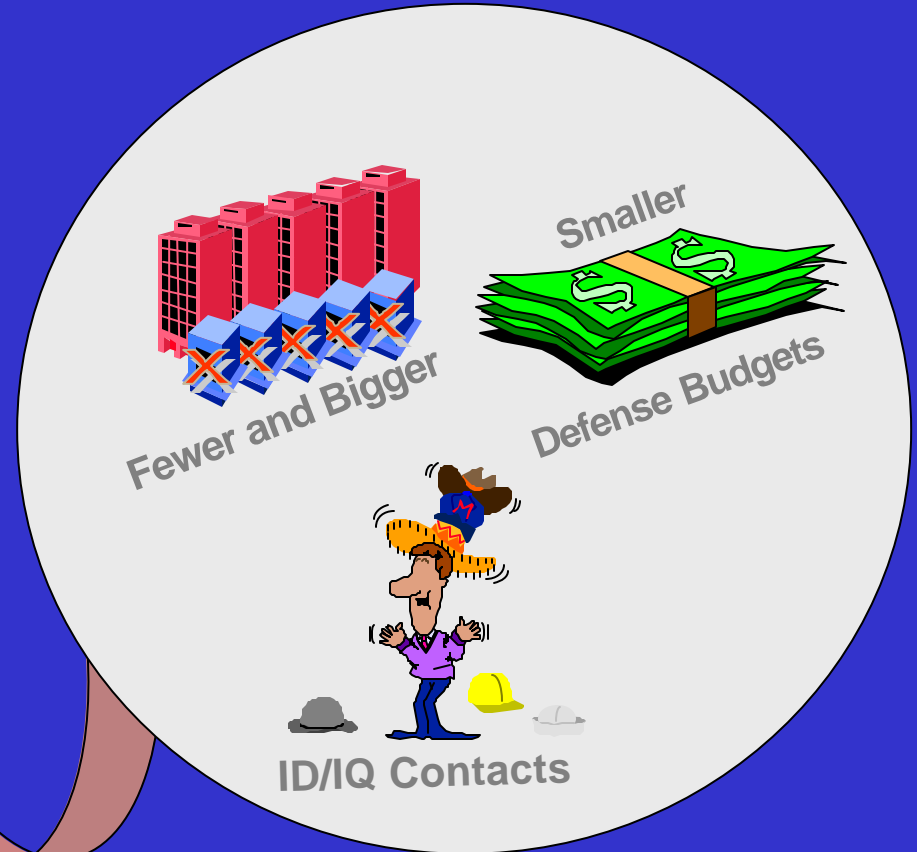## 2000's Sustainment Organizations

- **Contractor Logistics Support**
- **Increased "Command Support"**
- **Lean Logistics**
- **Experience Drain**
- **Technology Pace**
- **Outsourced Work**
- **COTS vs MILSPEC**
- **Smaller Workforce**
- **Just-In-Time Supply**

Experience Drain

Smaller Defense Budgets

COTS vs MILSPEC

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Defense Contractors - Today

Impacts on 2000's Defense Contractors

- **Fewer and Bigger**
- **ID/IQ Contracts**
- **Fewer New Starts**
- **Out-sourced Work**
- **Single Process Initiative**

Fewer and Bigger

Smaller Defense Budgets

ID/IQ Contacts

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Acquisition Environment - Today

2000's Interdependent Organizations

- System of System Demands
- Spiral Development
- Constant Initiative Flow
- Increased ACQTEMPO
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- Lean Logistics
- Experience Drain
- Technology Pace
- Outsourced Work
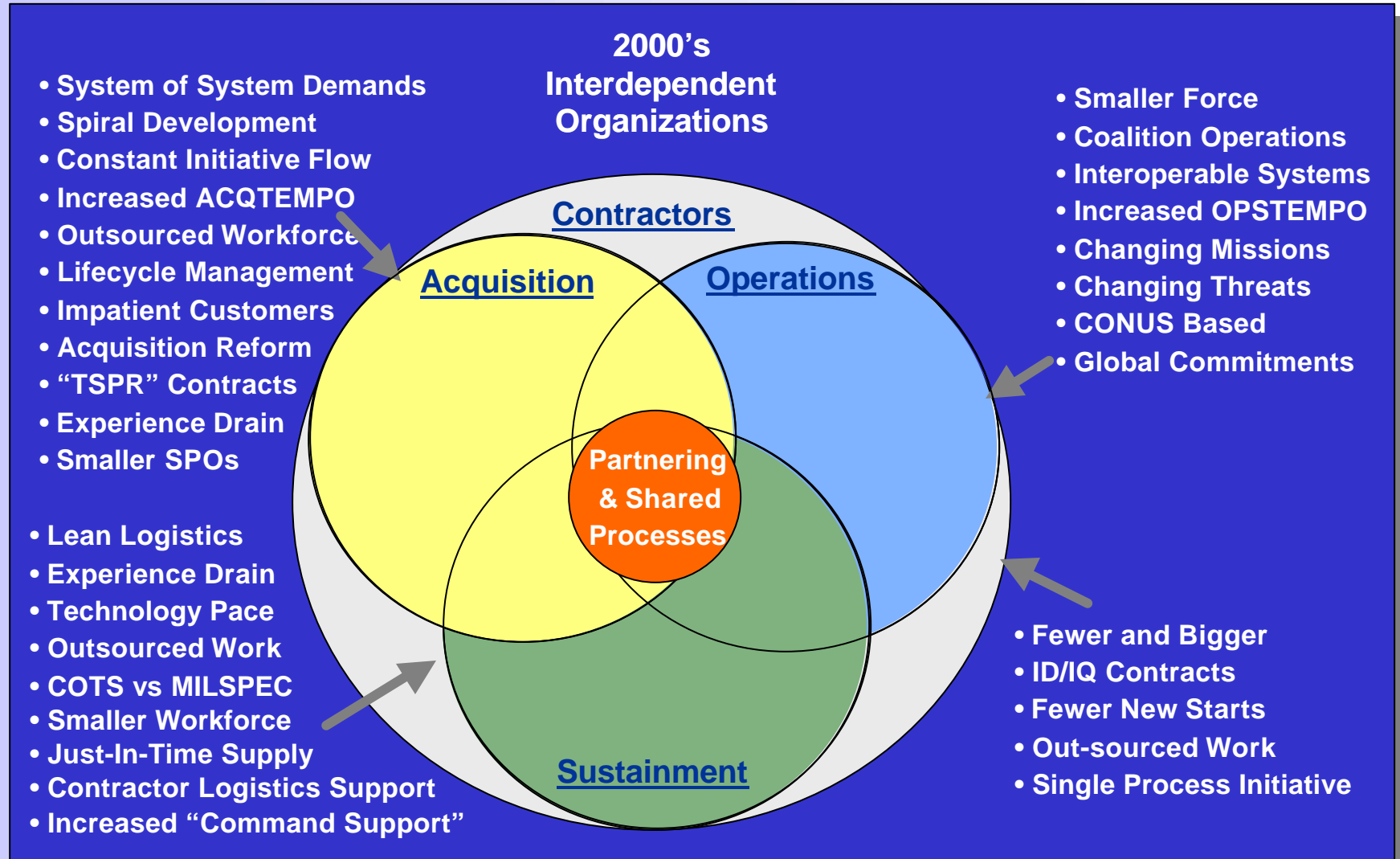- COTS vs MILSPEC
- Smaller Workforce
- Just-In-Time Supply
- Contractor Logistics Support
- Increased "Command Support"

Contractors

Acquisition

Operations

Partnering & Shared Processes

Sustainment

- Smaller Force
- Coalition Operations
- Interoperable Systems
- Increased OPSTEMPO
- Changing Missions
- Changing Threats
- CONUS Based
- Global Commitments

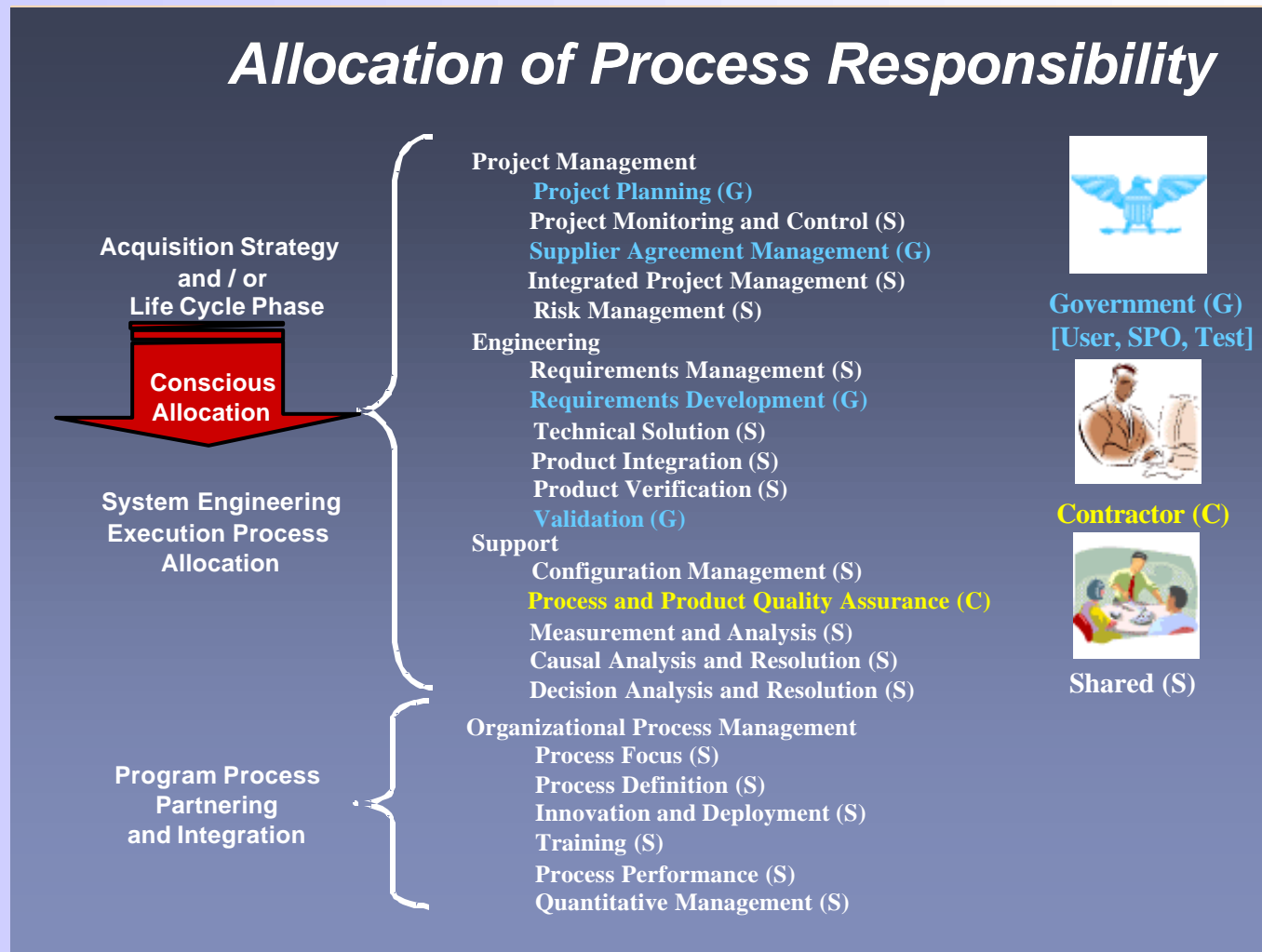- Fewer and Bigger
- ID/IQ Contracts
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Process Sharing and the CMMI

Allocation of Process Responsibility

**Acquisition Strategy
and / or
Life Cycle Phase**

**Conscious
Allocation**

**System Engineering
Execution Process
Allocation**

**Program Process
Partnering
and Integration**

Project Management
   Project Planning (G)
   Project Monitoring and Control (S)
   Supplier Agreement Management (G)
   Integrated Project Management (S)
   Risk Management (S)
Engineering
   Requirements Management (S)
   Requirements Development (G)
   Technical Solution (S)
   Product Integration (S)
   Product Verification (S)
   Validation (G)
Support
   Configuration Management (S)
   Process and Product Quality Assurance (C)
   Measurement and Analysis (S)
   Causal Analysis and Resolution (S)
   Decision Analysis and Resolution (S)
Organizational Process Management
   Process Focus (S)
   Process Definition (S)
   Innovation and Deployment (S)
   Training (S)
   Process Performance (S)
   Quantitative Management (S)

**Government (G)
[User, SPO, Test]**

Contractor (C)

Shared (S)

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Potential Process Sharing Benefits

- A common government - contractor framework
- Compatible capability levels (government too!)
- Integration of government and contractor processes
  - Insight with an understanding of contractor process
  - Concentrate on your process responsibilities
  - Tailor standard processes don't reinvent them
- An extension of the Single Process Initiative
- Spiral development drives repetitive process cycles
- Provides a life-cycle management process framework that extends beyond stakeholder organizational boundaries

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Questions?

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